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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,885	01/15/2004	Edward W. Sheridan	EM- 1989	8465

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EXAMINER

SAVAGE, JASON L

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 10/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/759,885

Applicant(s)

SHERIDAN ET AL.

Examiner

Jason L. Savage

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8 and 10-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 and 10-21 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The limitation that the layer not in oxide form be selected from "pure metal hydrides" is not described in the specification or claims as originally filed and is considered new matter. On page 2, lines 10-13 of the specification recite that the non-oxide layer may comprise pure metal or compounds of one or more of the recited metals. The specification further recites that metal hydrides and metals with interstitial hydrogen may be used for the non-oxide layer. However, there does appear to be any basis for the limitation that the use of pure metal hydrides are contemplated.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1775

Claims 1-8 and 10-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The limitation that the layer of material not in oxide form may be "pure metal hydrides" is indefinite since it is unclear how a hydride of metals such as Al, Ti, Li and Mg would differ from pure metal hydrides.

Double Patenting

Claims 1-21 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 14 and 5-8 of copending Application No. 10/923,865 of Sheridan et al. (US 2005/0189050). Although the conflicting claims are not identical, they are not patentably distinct from each other because claim 14 of Sheridan recites an energetic material comprising layers of a first reducing material and an oxide. Claim 5 of Sheridan further claims that the reducing material is a metal. Although Sheridan does not claim the layer thicknesses, it would have been obvious to one of ordinary skill in the art to have provided the layers in any thickness that would make the energetic composition suitable for the use in which it would be intended. Claim 6-8 of Sheridan recites that the metal material may be Al, Ti, Li, Mg and may be in hydride form and the oxide material is an oxide of phosphorus.

Regarding claims 3-6 of the present invention, although Sheridan does not claim there are pluralities of each layer formed, it would have been obvious to one of ordinary

Art Unit: 1775

skill in the art to have provided multiple layers of each of the material layers such as is depicted in Figure 2 of Sheridan.

Regarding claims 7, 10 and 18-19, claim 6-8 of Sheridan recites that the metal material may be Al, Ti, Li, Mg and may be in hydride form and the oxide material is an oxide of phosphorus.

Regarding claim 8, claim 1 of Sheridan recites the oxide is of phosphorus.

Regarding claims 11 and 20, although Sheridan is silent to the use of interstitial hydrogen, it would have been obvious to one of ordinary skill in the art to have provided the metals in the form of interstitial hydrogen.

Regarding claim 13, although Sheridan does not claim adhering the composition to a substrate or the materials used, it would have been obvious to have formed the composition on a base substrate of any of the materials claimed.

Regarding claims 15-16, Sheridan teaches phosphorus and Mg may be used, as such, it would meet the claim limitations after the material is detonated.

Regarding claim 17, the energetic composition of Sheridan would have been just as useful for use in a tampering device as that claimed by Applicant.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102/103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-8 and 10-21 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Danen et al. (US 5,266,132).

Danen teaches an energetic material comprising a plurality of layers **A** and a plurality of layers of materials **B** which are reactive with one another wherein the layers have thicknesses from between 1-1000 nm (col. 2, ln. 16-68 and Figure 1). Danen further teaches that the layers may comprise a metal such as aluminum and an oxide such as cupric oxide (col. 3, ln. 15-33).

Regarding the limitation that the layer in non-oxide form be selected from pure metal hydrides and metals with interstitial hydrogen, Danen teaches that the reacting materials may include aluminum, titanium, magnesium, lithium and hydrides thereof (col. 5, ln. 9-44). Absent clarification as to what would constitute a pure metal hydride, it is the position of the Examiner that hydrides of the claimed metals would meet the limitation of pure metal hydrides. In the alternative, absent a teaching of the criticality or showing of unexpected results of the metal hydride compounds being pure metal hydrides, it would not provide a patentable distinction over the prior art. It would have been within the purview of one of ordinary skill in the art to have selected any metal hydrides, including pure metal hydrides for the non-oxide layer in the energetic material of Danen with a reasonable expectation of success.

Regarding claim 5, Danen teaches that layers **A** and **B** are adjacent to one another (Figure 1). In the alternative, although Danen teaches a buffer layer **b** is formed between them, Danen teaches that the buffer may be a self-buffering which

Art Unit: 1775

results from an initial reaction between adjacent layers of the layers **A** and **B** (col. 3, ln. 15-33). As such, the composite of Danen would meet the limitation of layers **A** and **B** being adjacent to one another.

Regarding claims 7-8, 10-11 and 18-20, Danen teaches that the reacting materials may include aluminum, titanium, magnesium, lithium and hydrides thereof and that the oxide materials may include Fe (col. 5, ln. 9-44).

Regarding claim 12, the sputtering deposition of Danen (col. 3, ln. 43-62) would result in the same composite as that claimed by Applicant.

Regarding claim 13, Danen teaches composite may be formed on any conventional substrate material including those claimed by Applicant (col. 4, ln. 20-30).

Regarding claim 14, Danen teaches the composite is suitable for use in explosive applications (col. 1, ln. 9-15). As such, it would have been obvious to one of ordinary skill in the art to have employed energetic materials typically employed in explosive applications such as those claimed into the energetic material of Danen with a reasonable expectation of success.

Regarding claim 15, Danen teaches the same energetic material structure as that claimed by Applicant. Furthermore, Danen teaches the composite is suitable for use in explosive applications (col. 1, ln. 9-15). As such, one would expect that energetic fragments would form upon detonation just as that claimed by Applicant.

Regarding claim 16, Danen does not exemplify an embodiment wherein fragments of the detonated energetic material would comprise Mg and P. However, Danen does recite that Mg and the reaction product formed by reaction of Mg is suitable

Art Unit: 1775

for use in the energetic material (col. 5, ln. 30-34). Absent a teaching of the criticality or showing of unexpected results from the detonated material containing some amount of P in the formed Mg containing fragments, it would not provide a patentable distinction over the prior art of Danen,

Regarding claim 17, the energetic material of Danen would be just as suitable for use in an anti-tamper device as the energetic device claimed since Danen teaches the same structure which is claimed.

Response to Arguments

Applicant's arguments filed 7-13-06 have been fully considered but they are not persuasive.

Applicant's statement that a Terminal Disclaimer will be filed at the appropriate juncture to overcome the double patenting rejections over Sheridan has been noted.

Applicant argues that although Danen teaches that reacting metals such as aluminum, titanium, magnesium, lithium and hydrides thereof may be used, Danen does not teach the use of pure metal hydrides or metals with interstitial hydrogen. Applicant also asserts that Danen teaches away from these materials although does not elaborate on what Danen is viewed as teaching away from the claimed embodiments.

As was recited in the rejections above, it would have been obvious to one of ordinary skill in the art to have used any form of hydride including pure metal hydrides or metals with interstitial hydrogen with a reasonable expectation of success. Absent a

Art Unit: 1775

teaching of the criticality or showing of unexpected results, the claimed metal hydrides do not provide a patentable distinction over the prior art.

Prior Art not Relied Upon

The following is a listing of prior art which as deemed pertinent to the present invention however it was not relied upon in the rejections above:

Nielson et al (US 6,224,099) teaches an energetic materials comprising metal materials including hydrides and oxidizing materials including materials such as RDX (col. 3, ln. 50-67).

Hinshaw et al. (US 5,439,537) teaches an energetic material comprising metal material and an oxidizing agent to form oxide portions. Hinshaw further teaches that hydrides of the metal may be employed in the energetic material (col. 3, ln. 25-48).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

Art Unit: 1775

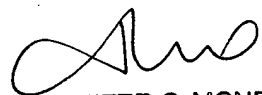
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason L. Savage whose telephone number is 571-272-1542. The examiner can normally be reached on M-F 6:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil can be reached on 571-272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jason Savage
9-27-06


JENNIFER C. MCNEIL
SUPERVISORY PATENT EXAMINER
9/30/06